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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/588,999	06/06/2000	Robert S. Wegeng	12672-E	9320

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EXAMINER

MEDINA SANABRIA, MARIBEL

ART UNIT	PAPER NUMBER
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1754

DATE MAILED: 07/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/588,999

Applicant(s)

WEGENG ET AL.

Examiner

Maribel Medina

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 29 April 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12, 21-23, 25-40 and 50-87 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 2-5, 21, 35-40, 69-72 and 77-87 is/are allowed.
- 6) ☒ Claim(s) 1, 6, 7, 10, 22, 23, 54, 58, 74 and 75 is/are rejected.
- 7) ☒ Claim(s) 8, 9, 11, 12, 25-34, 50-53, 55-57, 59-68, 73 and 76 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 April 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |                                                                                                                                                             |                                                                                         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                                                                 | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                                                        | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>9/29/05</u> ; <u>4/29/05</u> | 6) <input type="checkbox"/> Other: _____                                                |

## **DETAILED ACTION**

### **Information Disclosure Statement**

1. The information disclosure statements (IDS) submitted on 9/30/2004 and 4/29/2005 have been considered by the Examiner. The IDS 9/30/2004 has been marked up as a duplicate of the IDS filed on 4/29/2005.

### **Response to Arguments**

2. Applicant's arguments filed on 4/29/2008 have been fully considered but they are not persuasive.

Applicants argue: *"Independent claims 1, 22 and 58 are patentable over WO 99/00186 because these claims recite apparatus capable of or methods in which a first unit operation is again performed on the stream. This feature is not described in WO 99/00186. Specifically, in WO' 186, the unit operation performed in chamber 114 is receiving heat, i.e., heating, whereas the unit operation performed in chamber 108 is giving heat, i.e., cooling. As set forth in the definition of "unit operation" on page 7 of the present application, heating and cooling are clearly different unit operations."*

In regards to the apparatus claim, the apparatus of WO 99/00186 is used to perform unit operations, and have the same structure of the instantly claimed apparatus; therefore it meets the instant claims limitations. Note, that a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art.

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See *In re Casey*, 370 F.2d 576, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 312 F.2d 937, 939, 136 USPQ 458, 459 (CCPA 1963).

In regards to method claims, the unit operations of cooling and heating of WO 99/00186 clearly embrace the instantly claimed unit operations as defined by applicants in page 7, lines 7-11. *"Unit process operation" refers to an operation in which the chemical or physical properties of a fluid stream are modified. Unit process operations (also called unit operations) may include modifications in a fluid stream's temperature, pressure or composition. Typical unit process operations include pumping, compressing, expanding, valving, mixing, heating, cooling, reacting, and separating."*

Applicants further argue: *"Claims 1, 22 and 58 are further patentable over WO 99/00186 because these claims either (1) a microcomponent device and a processing device or (2) first and second devices. It is clear from the descriptions in the specification (for example, page 28, line 24) that the term "device", in the context of these claims<sup>1</sup> is not merely a layer in a laminated device. WO 99/00186 does not describe of these claims, s no apparatus or methods with multiple devices."*

This argument is not convincing, the layers disclosed the WO 99/00186 have been interpreted to be a device. Note, that the reference layers perform the same function of the instantly claimed devices, therefore the reference meet the limitations instantly claimed. Note, that the term "device" have been give the its broadest interpretation as defined in the Merrian Webster's Collegiate Dictionary, 10<sup>th</sup> Edition, p.317 "a piece of equipment or a mechanism designed to serve a special purpose or perform a special function"

Finally, applicants argue: *"Claim 6 recites a "continuous flow microchannel" in a first layer and a flow microchannel in a second layer, "wherein said first layer and said second layer*

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*cooperate to form at least two unit operations; and wherein said continuous flow microchannel forms at least a portion of said at least two unit operations." An example of such apparatus is described on page 30 of the specification. WO 99/00186 does not describe a continuous flow microchannel in a layer that forms at least a portion of at least two unit operations, which operate between first and second layers. Accordingly, withdrawal of the rejection of claims 6, 7, 10, 74 and 75 is respectfully requested.*

This argument is not convincing, the apparatus of *WO 99/00186* is used to perform unit operations, and have the same structure of the instantly claimed apparatus, therefore it meets the instant claims limitations. Note, that a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 370 F.2d 576, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 312 F.2d 937, 939, 136 USPQ 458, 459 (CCPA 1963).

### **Claim Rejections - 35 USC § 102-Maintained**

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 6, 7, 10, 22, 23, 54, 58, 74 and 75 are rejected under 35 U.S.C. 102(b) as being anticipated by WO 99/00186 (Tonkovich et al).

Regarding claims 1, 22 and 58, Tonkovich et al disclose a micro component apparatus and method for conducting unit operations comprising: a first inlet (120), a first exit (104), a first array of microchannels (in section 114) and a second array of microchannels (in section 108); wherein, during operation, a steam (working fluid) enters the first inlet (120) of the device and is distributed among said first array of microchannels and first unit operation (i.e. heating of the working fluid) is performed on said stream, said stream exiting through the first exit (104); a processing device (i.e. exothermic reaction chamber) (100) connected to the first exit (104) of the micro component device; said processing device being capable of modifying said stream by a second unit operation (chemical reaction); and outlet (106) of the processing device connected to a second inlet (106) of the micro component device through a second inlet; and the second array of microchannels connected to a second inlet (106) and a second exit (112) connected to said second array of microchannels; wherein, during operation, said stream (re-enters said micro component device and is distributed among the second array of microchannels where said first unit operation can again be performed on the stream, and said second stream exits through the second exit and exits the micro component device. (See pages 5-6 and Figure 1a).

Regarding claims 6 and 7, Tonkovich et al apparatus of Figure 1a, meets the limitations of the claims wherein the first layer is section 114 and the second layer is section 108. Regarding claim 10 the third layer is reaction section 100.

No difference is seen between the instantly claimed invention and Tonkovich et al disclosure.

**Allowable Subject Matter-Maintained**

5. Claims 2-5, 21, 35-40, 69, 70-72, and 78-87 have been allowed.

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6. Claims 8, 9, 11, 12, 25-34, 50-53, 55-57, 59-68, 73 and 76 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. The following is an examiner's statement of reasons for allowance: Claims 2-5, 21, 35-40, 69, 70-72, and 78-87 are allowable upon consideration of the prior art.

Regarding claims 2-5, and 69-72, the prior art fails to disclose or suggest that the heat exchanger has a thermal power density of at least 0.6 W per cubic centimeter and an exergetic efficiency of at least 80%.

Regarding claim 21, the prior art fails to disclose or suggest the method of exchanging heat in a microchannel device, comprising: providing a first stream in a microchannel that exchanges heat with a second stream, wherein the first stream remains in the microchannel and, subsequently, the first stream exchanges heat with a third stream without leaving the microchannel.

Regarding claims 35-40 and 77, the prior art fails to disclose or suggest that the second unit operation modifying the first stream comprises a chemical separation, with at least one reaction product being preferentially removed from a first stream.

Regarding claims 78-87, the prior art fails to disclose or suggest the steps of the cited claims.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

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8. The following is a statement of reasons for the indication of allowable subject matter: Claims 8, 9, 11, 12, 25-34, 50-53, 55-57, 59-68, 73 and 76. The limitations of these claims are not disclosed nor suggested by the prior art.

### **Conclusion**

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.


10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maribel Medina whose telephone number is (571) 272-1355. The examiner can normally be reached on Monday through Thursday from 8:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on (571) 272-1358. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Maribel Medina   
Examiner  
Art Unit 1754

  
**STANLEY S. SILVERMAN**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 1700**